Emergency Caesarean Hysterectomy A Ten Year Retrospective Review In KK Women's and Children's Hospital, Singapore

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ABSTRACT

Introduction: *The incidence of caesarean hysterectomy in our institution is expected to rise with the rising incidence of caesarean section, placenta praevia and accreta. It is usually done electively due to lesser morbidity. For those done as emergency, I would like to define their incidence, causes, risk and confounding factors, and complications.*

Methods: *Cases were retrieved from computerised medical records from July 2003 to June 2013 using the code for Caesarean Section + Hysterectomy, selecting emergency cases only. Causes, risk and confounding factors, and complications were recorded.*

Results: *There were a total of 16 cases of emergency caesarean hysterectomies, giving an incidence of 1.3:10,000 deliveries. Main cause was placenta accreta vera (13/16, 10/13 had placenta praevia major). Placenta increta was present in 2/16 (one of which had placenta praevia major). Main risk factor was a previous uterine procedure (12/16). Gestational age at delivery was less than 34 weeks in 7/16. Uterine contractions at the time of delivery were present in 10/16. Main complications were blood transfusion, intensive care unit admission and disseminated intravascular coagulation.*

Conclusions: *Incidence was 1.3:10,000 deliveries. Main cause was placenta accreta vera. The main risk factor was a previous uterine procedure. Main complications were blood transfusion, intensive care unit admission and disseminated intravascular coagulation.*

Keywords: Emergency caesarean hysterectomy, placenta accreta vera, placenta praevia major, previous uterine procedure, disseminated intravascular coagulation

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INTRODUCTION

With the rising incidence of caesarean section (CS), the incidence of placenta praevia and placenta accreta are expected to rise too, with its attendant increase in caesarean hysterectomy (CH). Placenta accreta has been shown in the developed world to be a leading cause of caesarean hysterectomy. CH are usually planned as elective cases due to lesser morbidity. However, they are still performed as emergencies when undiagnosed or unanticipated, but this has not been studied locally.

AIMS

To define the incidence, causes, risk and confounding factors, and complications of emergency caesarean hysterectomy (ECH).

METHODS

Cases were retrieved from computerised medical records over the last ten years from July 2003 to June 2013 using the code for Caesarean Section + Hysterectomy, SI037U, and then selecting emergency cases only. Patient confidentiality was maintained. An ECH is defined as one that is required for uncontrollable uterine bleeding not responsive to conservative measures at emergency CS.

The total number of deliveries was obtained over the same period. The incidence of ECH was obtained by dividing the total number of cases by the total number of deliveries.

The cause was searched from the operative notes and classified as one of the following:
1. Placenta accreta
2. Placenta praevia, type 3-4
3. Abruptio placentae
4. Intractable uterine atony
5. Uterine rupture, tear or cervical laceration with uterine atony.

Presence of risk factors such as those that result in myometrial damage such as previous caesarean sections (and number), previous myomectomies, previous abortions (and number, due significant curettage causing Asherman syndrome), endometrial thermal ablation, uterine artery embolisation, and others such as advanced maternal age and multiparity were recorded.

Confounding factors that were recorded were presence of uterine fibroid (especially submucous) or adenomatosis, gestational age at delivery less than 34 weeks, prolonged labour, and multiple pregnancy.

Complications of surgery that were recorded included blood transfusion, disseminated intravascular coagulation (DIVC), urinary tract including bladder injury, surgical re-exploration, ICU admission, respiratory failure requiring ventilator support, renal failure, deep vein thrombosis (DVT) and pulmonary thrombo-embolism (PTE), and maternal or neonatal death.

RESULTS

There were a total of 16 cases over the ten-year period. If the total number of deliveries over this period was 120,000, the incidence of ESH would be 1.3 per 10,000. Half of the parturients were Chinese and the other half were Malay. Their gravidity was 4 (median, range 2-7), weight 65.9 (median, range 47.2-105.0) kg, height 1.53 (median, range 1.48-1.72) m, and BMI 24.56 (median, range 18.17-35.49).

Of the 16 cases, two were crash cases (one of which was a gravida 5 parturient, with two previous abortions and breech presentation at 29.1 weeks gestation admitted for absent foetal movement and foetal bradycardia from massive abruptio placentae, placenta accreta vera, estimated perioperative blood loss of 1.5 L and complicated by neonatal death preceded by Apgar scores of 0/0/1/2 at 1/5/20/30 min respectively; and the other a gravida 2 parturient with one previous CS and transverse or oblique lie at 29.7 weeks gestation admitted for massive antepartum haemorrhage (APH) from placenta praevia major (PPM) type 4, placenta accreta vera, estimated perioperative blood loss of 8.0 L, lowest perioperative haemoglobin (Hb) of 5.4 g% and complicated by packed red cells (PC) transfusion of 4.9 L and massive DIVC requiring intraoperative novo7) and one a perimortem crash case (an unbooked case, with no previous uterine procedure, complicated by APH at 37 weeks gestation at home from PPM type 4 posterior, intrauterine death on admission uterine scan, cardiac arrest and CPR for 10 min on the operating table, placenta accreta vera, estimated operative blood loss of only 600 ml but lowest postoperative Hb of 3.7 g%, PC transfusion of 3.5 L, DIVC, failed Rusch balloon insertion and neonatal death preceded by Apgar scores of 0/3), requiring them to be rushed to the operation theatre.

Type of anaesthesia used is given in Table 1. General anaesthesia was given or required in 14/16 cases.

Causes of ESH are given in Table 2. The most common cause was placenta accreta vera (13/16). Of these 13, four had PPM type 4 anterior, four PPM type 4 posterior, one PPM type 4 (unspecified), one PPM type 4 posterior and abruptio placentae, two abruptio placentae, and one no mention of placental location. Of the two parturients with placenta increta, one had PPM type 4 anterior and the other uterine scar rupture. The parturient with intractable intraoperative uterine atony had emergency CS for cephalo-pelvic disproportion (CPD) at 37 weeks

gestation after a prolonged labour lasting 17.0 hours, with an estimated perioperative blood loss of 4.5 L and lowest perioperative Hb of 4.6 g% and who subsequently required a surgical re-exploration.

Risk and confounding factors for ECH are given in Table 3 and 4 respectively. 12/16 cases had a previous uterine procedure. Of these 12, three had two previous CS. Their age was 35.5 (median, range 20-45, 4/16 cases aged 40 and above) years, and parity 1.5 (median, range 1-5, 8/16 cases having parity more than one). There were no known cases of Asherman syndrome, endometrial thermal ablation, or uterine embolisation.

No parturient had a submucous fibroid. Mean gestational age at delivery was 33.6 years, i.e. less than 34 weeks, and gestational age at delivery was less than 34 weeks in 7/16 cases (range 17.4 – 33.0 weeks). Preterm labour was present in 5/16 cases. Prolonged labour (more than 12 hours) was present in only 2/16 cases (17.0, 14.0 hours). Uterine contractions at the time of delivery were present in 10/16 cases. There was only one parturient with multiple (i.e. twin) pregnancy.

Complications of ESH are given in Table 5. There were no maternal deaths. All cases required ICU admission and blood transfusion. Estimated perioperative blood loss was 2,500 (median, range 600-8,000) ml and lowest perioperative Hb was 7.95 (median, range 3.7-9.8) g%. The amount of PC transfused was 1,885 (median, range 1,009-4,914) ml, i.e. about six units, with 4/17 parturients requiring more than 10 units. Only 2/7 parturients with DIVC required novo7. One was the perimortem crash case described above. The other parturient was a 41 year old gravida 6 parturient with one previous CS, two previous abortions, APH, placenta accreta, praevia type 4 anterior who had a classical CS. The parturient requiring surgical re-exploration is the parturient with intractable intraoperative uterine atony described above. No parturient developed acute transfusion reaction, electrolyte imbalance, DVT or PTE.

There was one foetal and two neonatal deaths. The parturient with foetal death was a gravida 7 parturient at 17.4 weeks gestation with one previous CS, five previous abortions, spontaneous rupture of a previous CS scar with extrusion of placenta increta, haemoperitoneum of 1.0 L, uterine fibroid, failure to secure haemostasis with hysterotomy and wedge resection, lowest perioperative Hb of 6.4 g%, PC transfusion of 4.5 L and complicated by renal failure. The two parturients with neonatal deaths

were the crash and perimortem crash cases described above.

The Apgar scores for the first minute were 8.5 (median, range 0-9) and the fifth minute were 9 (median, range 0-9). For the case with twin pregnancy, the second twin Apgar scores were 9/9.

DISCUSSION

General anaesthesia was used in 14/16 cases considering the circumstances of the ECH.

Caesarean hysterectomy is the treatment of choice for placenta accreta. Thus, the incidence of caesarean hysterectomy would approximate that for placenta accreta. Elective caesarean hysterectomy, preceded by placement of an internal iliac or uterine artery balloon occlusion embolisation catheter to reduce post-partum haemorrhage (PPH) and likelihood of hysterectomy, is desireable compared to ECH as there would be less blood loss and complications[1]. This has really only picked up in the last 10-15 years due to better use of ultrasound and MRI followed by experienced interventional vascular radiology. Pelvic embolisation to save the uterus is currently being studied at our institution. The ECH incidence in our institution of 1.3 per 10,000 deliveries is understandably lower than the incidence of elective caesarean hysterectomy in our institution of about 3.3 per 10,000 deliveries as most cases are diagnosed preoperatively and thus done electively. Our incidences are compareable to Flood KM et al[2].

Chandrakanthan et al[3] from our institution found in their two year retrospective series from January 2012 - December 2013 an incidence of 3:10,000 for peripartum hysterectomy. This, by definition, refers to emergency hysterectomy following vaginal and caesarean delivery. Out of six cases in two years, only one followed emergency caesarean delivery giving an incidence of 0.5:10,000 for ECH. Our ten year retrospective series from July 2003 - June 2013 which showed an incidence of 1.3:10,000 for ECH refers only to hysterectomy following emergency caesarean delivery, not those following vaginal delivery. The difference in the ECH rate is probably due to the longer time period of data analysis of an infrequent event (ten years compared to two years) in our series.

Placenta accreta, the most common cause of ECH as in the developed world[4,5,6,] when suspected from either an anterior or posterior placenta praevia overlying the

uterine scar with myometrial damage following a history of previous caesarean section(s), is often confirmed with ultrasonography and, occasionally in addition, magnetic resonance imaging to allow elective preterm (at 34 weeks gestation) caesarean hysterectomy with the placenta left in-situ. In the presence of a placenta praevia, the risk of placenta accreta was 3%, 11%, 40%, 61%, and 67% for the first, second, third, fourth, and fifth or greater repeat caesarean deliveries, respectively[7], i.e. increasing after the first caesarean delivery. Placenta praevia without previous uterine surgery is associated with a 1-5% risk of placenta accreta[8]. However, the parturient may present for an ECH before the scheduled date. 7/16 cases had an ECH at less than 34 weeks gestation. We found uterine contractions present at the time of delivery (i.e. admitted in labour) in 10/16 cases. Sometimes, the diagnosis of placenta accreta is made at the time of caesarean section, necessitating also an ECH.

The incidence of placenta increta is expectedly lower (2/15 cases) as it would normally result in elective caesarean hysterectomy. The 9/15 incidence of placenta accreta or increta developing from a PPM type 4 with a history of a uterine procedure confirms the expectation of the placenta adhering to and invading into a uterine scar. Giambattista et al9 and Ossola et al10 had both showed major placenta praevia to be contributory.

Risk factors were present in 12/16 cases, previous caesarean section accounting for 9/12, also shown by Giambattista E et al9, and surgical abortion accounting also for 9/12, also shown by Ossola et al10. Wong TY6 had also showed previous uterine surgery, especially previous caesarean section, to be a risk factor.

Confounding factors were present in 11/16 cases, gestational age at delivery less than 34 weeks accounting for 7/11, also shown by Giambattista E et al[9]. Twin pregnancy accounted for only 1/11, while Ossola et al[10] had showed number of fetuses to be a factor.

The blood loss in our audit of 600-8,000 ml is comparable to other centres[11] but the cell saver was not used for any of those cases. Complications are frequent5 and the most common one, other than blood transfusion and ICU admission that were required in all cases, was DIVC, present in 7/16 cases, and this could be explained by the presumed dilution of platelets and coagulation factors. As only 3/16 cases developed urinary tract injury requiring repair, the incidence of placenta percreta must have been minimal. Preoperative cystoscopy with placement of ureteral stents may help prevent inadvertent urinary tract injury. A three-way Foley catheter placed in the bladder through the urethra to allow irrigation, drainage, and distension of the bladder may help during dissection. Respiratory failure is presumably due to acute respiratory distress syndrome-like illness. Renal failure occurred only in 1/16 cases probably due to absence of protracted hypotension. DIVC and urinary tract injury were also the most common complications in Awan N et al's5 and Wong TY's6 study.

Foetal death seems inevitable when there is rupture of a uterine scar with haemoperitoneum and uteroplacental hypoxia. The two cases of neonatal death involved crash caesarean section with pre-existing intrauterine hypoxia. Foetal death and one of the two neonatal deaths occurred in preterm caesarean deliveries, a known cause.

No parturient had an attempt at pelvic embolisation before ECH.

CONCLUSION

The incidence of ECH was 1.3 per 10,000 in our institution. The most common cause was placenta accreta vera. The main risk factor is a previous uterine procedure. The main complications were blood transfusion, ICU admission and DIVC.

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Table1: Type of Anaesthesia for Emergency Caesarean Hysterectomy

	Type of anaesthesia	no of cases
1	General anaesthesia	12
2	Spinal anaesthesia converted to general anaesthesia	1
3	Epidural anaesthesia converted to general anaesthesia	1
4	Spinal anaesthesia	1
5	Combined spinal epidural anaesthesia	1
	Total	16

Table 2. Causes of Emergency Caesarean Hysterectomy

	Causes	no of cases
1	Placenta accreta, praevia type 4 anterior, antepartum haemorrhage, uterine atony	2
2	Placenta accreta, praevia type 4 posterior, antepartum haemorrhage, uterine atony	1
3	Placenta accreta, praevia type 4 anterior, antepartum haemorrhage	1
4	Placenta accreta, praevia type 4 posterior, antepartum haemorrhage	1
5	Placenta accreta, praevia type 4 (unspecified), antepartum haemorrhage	1
6	Placenta accreta, praevia type 4 anterior	1
7	Placenta accreta, praevia type 4 posterior	1
8	Placenta accreta, abruptio, antepartum haemorrhage, uterine atony	2
9	Placenta accreta, praevia type 4 posterior, abruptio, antepartum haemorrhage, uterine atony	1
10	Placenta accreta, praevia type 4 posterior, antepartum haemorrhage, uterine atony, adenomyosis	1
11	Placenta accreta	1
12	Placenta increta, praevia type 4 anterior, antepartum haemorrhage	1
13	Placenta increta with uterine scar rupture	1
14	Intractable uterine atony	1
	Total	16

Table 3. Risk Factors for Emergency Caesarean Hysterectomy

	Risk factors	no of cases (no of previous procedures respectively)
1	Previous caesarean section(s) + previous surgical abortion(s)	6 (1+5, 2+3, 2+1, 1+2, 1+3, 1+1)
2	Previous surgical abortion(s)	3 (2,1,2)
3	One previous caesarean section	2
4	Two previous caesarean sections + one previous myomectomy	1
	Total	12

Table 4. Confounding Factors for Emergency Caesarean Hysterectomy

	Confounding factors	no of cases
1	Presence of adenomyosis	1
2	Gestational age (less than 34 weeks)	7 (29.1, 31.9, 17.4, 32.1, 31.3, 33.0, 29.7 weeks)
3	Prolonged labour (more than 12 hours)	2 (17.0, 14.0 hours)
4	Twin pregnancy	1
	Total	11

Table 5. Complications of Caesarean Hysterectomy

	Complications	no of cases
1	ICU admission + blood transfusion	5
2	ICU admission + blood transfusion + DIVC	4
3	ICU admission + blood transfusion + urinary tract injury	2
4	ICU admission + blood transfusion + DIVC + urinary tract injury	1
5	ICU admission + blood transfusion + DIVC + respiratory failure requiring ventilatory support + surgical re-exploration	1
6	ICU admission + blood transfusion + DIVC + neonatal death	1
7	ICU admission + blood transfusion + renal failure + foetal death	1
8	ICU admission + blood transfusion + neonatal death	1
	Total	16